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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|-----------------------|---------------------|------------------|
| 09/533,705 | 03/23/2000 | Matthew Douglas Penry | NSC1-G3900 | 1251 |
| 7590 | 04/22/2004 | | EXAMINER | |
| Michael J. Pollack Stallman & Pollack 121 Spear Street, Suite 290 San Francisco, CA 94105 | | | DUONG, THOI V | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2871 | |

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/533,705 | PENRY ET AL. |
| | Examiner | Art Unit |
| | Thoi V Duong | 2871 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 26 January 2004.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 19-23 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 19-23 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 26, 2004 has been entered.

Accordingly, claims 1-18 were cancelled, and new claims 19-23 were added. Currently, claims 19-23 are pending in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 19-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. (USPN 5,764,324) in view of Janssen et al. (Pub. No. US 2001/0003474 A1).

As shown in Figs. 3-5, Lu et al. discloses a silicon-backed microdisplay comprising:

a silicon substrate 1 (col. 3, lines 35-37);

a silicon-side conductive layer 32 disposed on the silicon substrate (col. 4, lines 15-17);

a silicon-side passivation layer 50 disposed on the silicon-side conductive layer 32 (Fig. 4);

a cover glass 40;

a glass-side conductive layer 38 formed of ITO disposed on the cover glass 22 (col. 4, lines 40-42); and

liquid crystal material 36 sandwiched between the silicon substrate and the cover glass substrate,

wherein, *re claim 20*, the silicon-side conductive layer 32 is formed of aluminum (col. 4, lines 15-17);

wherein the work function balance between the aluminum silicon-side conductive layer 32 and the ITO glass-side conductive layer 38 is more than 0.29 eV (col. 2, lines 40-42 and col. 5, lines 54-56); and

wherein the glass-side passivation layer comprises a material selected from SiO₂, or Al₂O₃, or an oxide or nitrite of titanium or tantalum, or any other insulating material (page 2, paragraph 30).

Re claim 21, as shown in Fig. 6, Lu et al. discloses a silicon-side passivation layer 54 and an ITO layer formed on the conductive layer 32. Lu et al. teaches that the silicon-side passivation layer 54 is preferably a silicon dioxide film and the ITO layer may be replaced with an insulating layer such as silicon nitride layer (col. 6, lines 16-37)

However, *re claim 19*, Lu et al. does not disclose a glass-side passivation layer of a predetermined material and thickness disposed on the glass-side conductive layer.

As shown in Figs. 1 and 2, Janssen et al. also discloses a liquid crystal display comprising an insulating layer 26 disposed on a cover glass 22, a glass-side conductive layer 20, and a glass-side passivation layer 26 disposed on the glass-side conductive layer,

wherein the glass-side passivation layer 26 is 1000 angstroms thick or much thinner and comprises of silicon oxide (page 2, paragraphs 30 and 31).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the liquid crystal display of Lu et al. with the teaching of Janssen et al. by forming a glass-side passivation layer of a predetermined material and thickness on the glass-side conductive layer so as to prevent the electro-chemical interaction and eliminate the flicker (page 2, paragraph 18 and page 3, paragraph 39).

4. Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. (USPN 5,764,324) in view of Janssen et al. (Pub. No. US 2001/0003474 A1) as applied to claims 19-21 and further in view of Kaneko (USPN 6,504,588 B1).

The silicon-backed microdisplay of Lu et al. as modified in view of Janssen et al. above includes all that is recited in claim 22 except for the glass-side conductive layer having a characteristic resistance in the range of 100-500 ohms/square and a light transmissivity of 90% or greater.

As shown in Figs. 1 and 9, Kaneko discloses a liquid crystal display comprising an ITO electrode 3 having a characteristic resistance of 100 ohms/square and a light transmissivity of 90% or greater (col. 7, lines 5-10).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the silicon-backed microdisplay of Lu et al. with the teaching of Kaneko by an ITO glass-side conductive layer having a characteristic resistance of 100 ohms/square and a light transmissivity of 90% or greater to improve the brightness of the display (col. 7, lines 15-17).

5. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et al. (USPN 5,764,324) in view of Janssen et al. (Pub. No. US 2001/0003474 A1) as applied to claims 19-21 and further in view of Takamira et al. (USPN 6,143,418).

The silicon-backed microdisplay of Lu et al. as modified in view of Janssen et al. above includes all that is recited in claim 23 except for the combination of the glass-side passivation layer and the glass side conductive layer having an overall transmissivity of 90% or greater and a reflectivity of 1%.

As shown in Fig. 1, Takamira et al. discloses a transparent conductive film 10 comprising a transparent conductive film 1 and a transparent thin film (or passivation layer). In Table 2 and Table 3, Takamira et al. discloses that this transparent conductive film in "Comparative Example 2" has a high light transmissivity of about 102.7% and a low reflectivity of about 1% (col. 17, lines 55-65 and col. 18, lines 1-15). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the silicon-backed microdisplay of Lu et al. with the teaching of Takamira et al. by employing a transparent conductive film having an overall transmissivity of 90% or more and a reflectivity of about 1% so as to control the

tone of the transmitted images and to obtain an advantage over the static prevention and electromagnetic shielding of the display (col. 18, lines 59-65).

Response to Arguments

6. Applicant's arguments filed January 26, 2004 have been fully considered but they are not persuasive.

Applicant argued that neither Janssen et al. or Lu et al. teaches or suggests a silicon-backed microdisplay device having work function balance in the range of approximately 0.2 eV to 0.4 eV. The Examiner disagrees with Applicant's remarks because Lu et al. discloses a silicon-backed microdisplay comprising an aluminum layer having the work function in the range of 4.06 eV to 4.41 eV and an ITO layer having the work function of 4.7 eV; therefore, the work function balance of the silicon-backed microdisplay device is 0.29 eV or more (col. 5, lines 53-56).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

Thoi Duong *JWD*

04/07/2004



DUNG T. NGUYEN
PRIMARY EXAMINER